LIVESTOCK POPULATION METHODOLOGY

Review Draft

California Air Resources Board
October 2003

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Livestock Population Methodology

The livestock husbandry emission source includes nine emission inventory categories (EICs) including range cattle, dairy cattle, feedlot cattle, swine, poultry, sheep, goats, horses, and other livestock. While the emission estimates for livestock are based on the animal populations, current county specific populations are not available for all livestock categories. The California Department of Food and Agriculture (CDFA) publishes statewide summary of livestock populations in the annual Agricultural Resource Directory. In the 2001 agricultural resource directory, CDFA reported year 2000 county specific population for dairy cows and beef cows. The Agricultural Census developed by United States Department of Agriculture, provides more detail regarding animal population types and classes, but the latest county specific livestock population is for year 1997.

By combining the data from CDFA 2001 Agricultural Resources Directory and the USDA 1997 Agricultural Census, we are able to estimate the county specific livestock populations for year 2000. For the cattle EICs, we also incorporated the information from U.S EPA, California Cattleman Association (CCA), and the University of California Cooperative Extension. The estimation methodology is divided into two sections: cattle and non-cattle livestock. Population estimates for all livestock classes are provided in the appendix.

1. Cattle (Range Cattle, Dairy Cattle, Feedlot Cattle)

The emission inventory categories for cattle include range cattle, dairy cattle, and feedlot cattle. Range cattle and dairy cattle consist of animals that have different air emission ability. To facilitate the estimation, we subdivided the three EICs into 11 subcategories. The estimation begins with estimating the statewide population of each subcategory, then allocating the state totals to counties. The data used include CDFA 2001 Agricultural Resource Directory [1] and a report provided by the California cattleman's Association [2].

Table 1 lists all the cattle subcategories. Dairy Cattle are disaggregated into five subcategories including cows, bulls, pregnant heifers, young heifers, and calves. Dairy Cows include milk cows and heifers had calved. Pregnant heifer and young heifer are both female cattle, but they are typically raised in different facilities. While pregnant heifers are nearly always on dairy farms, young heifers may be raised on a dairy or reaggregated at separate heifer farms. Range Cattle consist of five subcategories of cows, bulls, heifers, calves, and stockers. Similar to dairy cows, beef cows comprise cows and heifers had calves. Beef Heifers are not subdivided because they are included in the cow/calf operations. Stockers are those cattle grazing on pasture before being placed in feedlots. All the cattle in feedlots are in the feeder category.

Table 1. Cattle Population Categories and Subcategories

Dairy Cattle	Range Cattle	Feedlot Cattle
Dairy Cows	Beef Cows	Feeders
Dairy Bulls	Beef Bulls	
Pregnant Dairy heifers	Beef Heifers	
Young dairy heifers	Beef Calves	
Dairy Calves	Stockers	

1.1 Data Source

The *2001 California Agricultural Resource Directory* is the primary data source for the cattle population estimates. Based on communication with the California Agricultural Statistic Services (CASS), the published statistics are derived from a survey of cattle population for January 1, 2001. Because the data is a snapshot of one day, we assumed that it represents an average day of the year 2000. Information provided by the CCA was used to identify the counties with feedlots.

At state level, the CDFA population summary includes 8 cattle categories: beef cows, milk cows, dairy heifers, beef heifers, other heifers, calves, steers, and bulls (see Table 2). At the county level, CDFA reports only the population of dairy cows, beef cows, and cattle and calves total of each county. In addition, there are 15,500 head dairy cows withheld from some counties population counts to avoid disclosure of individual operations. These are summarized into an "other counties" category.

1.2 Statewide Population

For estimating emissions, it is necessary to clearly divide the cattle into beef and dairy populations, and to clearly assign the different animals within these categories. Unfortunately, the CDFA data groups several different animals' types together, so it was necessary to disaggregate these populations. This section describes how we converted the CDFA statewide populations to the cattle subcategories needed for emission estimates. Table 2 lists the CDFA categories and our associated subcategories as well as the conversion equations if applicable. Detailed conversions are described by subcategory in the following sections.

1.2.1 Dairy Cows / Beef Cows

Beef cows is the same category as used in CDFA report.

Dairy cows is equal the CDFA statewide dairy cow population minus the 15,000 head withheld due to confidentiality reasons. This adjustment is necessary for the following calculation of subcategory-to-cow ratio to apportion the population of subcategories other than cows to counties.

1.2.2 Pregnant Dairy Heifer / Young Dairy Heifer

Dairy heifer populations from CDFA (750,000 head) were split into pregnant dairy heifers and young dairy heifers. Dairy heifer is a broad category including heifers prior to and during first conception. While the latter are often kept at dairies to enter milk production, the former might be raised on-site or off-site. Typically, dairy cows are kept in the milking cycle for three years; therefore at a minimum, one third of dairy cows are consequently replaced by heifers every year. This leads to the assumption that as many heifers as one-third of the dairy cows may be pregnant. However, because they only have a nine months gestation time, the population of pregnant dairy heifers needs to be adjusted by a factor of 0.75 (9 months / 12 months). The calculation equation is listed in table 2 and resulted in 386,000 head statewide Pregnant Dairy Heifers. The remaining 364,000 dairy heifers are categorized as Young Dairy Heifers.

Table 2. Statewide cattle and calves population from CDFA on January, 1, 2001

CDFA Category	**CDFA Population** (1,000 head)	**New Category**	**New Population** (1,000 head)
Beef cows*	780	Beef cows*	780
Milk cows*	1,560	Dairy cows = Milk cows – 15,000 head	1,545
Beef heifers*	140	Beef heifers*	140
Dairy heifers	750	Pregnant dairy heifers $= \text{Milk cows} \times \frac{1}{3} \times \frac{9}{12}$	386
		Young dairy heifers = Dairy heifers – Pregnant dairy heifers	364
Other heifers	170	Stockers $= (\text{Other heifers} + \text{Steers}) \times \frac{1-0.2}{3}$	320
Steers	630	Feeders = (other heifers + Steers) - Stockers	480
Bulls	70	Dairy Bulls	35
		Beef Bulls	35
Calves	1,050	Dairy Calves	724
		Beef Calves	326
All cattle and calves	**5,150**	**All cattle and calves**	**5,145**

* unchanged

1.2.3 Dairy Bulls / Beef Bulls

CDFA category of "bulls" was split into two categories of Dairy Bulls and Beef Bulls. Due to the growing usage of artificial insemination, bull numbers are usually kept very low. For dairies, the bull-to-cow ratio is even lower than that of beef operations. With the assumption that the bull-to-cow ratio of beef industry is double that of dairies, the bull population calculation equation is defined as:

$$\text{Bulls}_{\text{CDFA}} = \text{Beef Cows} \times 2 \times R_1 + \text{Dairy Cows} \times R_1$$

Where R_1 is the dairy bull-to-cow ratio, and is solved to be 0.023. The bull-to-cow ratio of beef operations is therefore 0.045. The dairy / beef bull population was calculated by multiplying Dairy / Beef Cow population with their bull-to-cow ratio. Of the 70,000 bulls, 35,000 head (1,560,000 * 0.023) was estimated as Dairy Bulls, and 35,000 head (780,000 * 0.045) was estimated as Beef Bulls.

1.2.4 Dairy Calves / Beef Calves

Like Dairy Bulls / Beef Bulls, the category of Dairy Calves / Beef Calves was split from CDFA category of "Calves" according to the Dairy Cow / Beef Cow population and the calf-to-cow ratio. In general, the more intense care of dairy cows enables dairies to have higher calving rate, so that their calf-to-cow ratio is higher than that of beef industry. By assuming dairy calf-to-cow ratio is 0.05 higher than that of beef operations, the calculation equation is:

$$\text{Calves}_{\text{CDFA}} = \text{Beef Cows} \times (R_2 - 0.05) + \text{Dairy Cows} \times R_2$$

Where R_2 is the calf-to-cow ratio of dairy, and solved to be 0.47. Therefore, of the 1,050,000 head calves, 724,000 head (1,560,000*0.47) was estimated as Dairy Calves, and 326,000 head was estimated as Beef Calves (780,000*0.42).

1.2.5 Stockers and Feeders

The categories of Stockers and Feeders were converted from the CDFA categories of "other heifers" and "steers". According to reports from EPA[7] and the California Cattlemen's Association (CCA)[3], stockers and feeders are two consecutive stages for final meat production, and the typical time cattle are at each stage is approximately the same, which is four months. This implies that Stockers and Feeders may have equal populations. However, additional information from CCA[8] and University of California Cooperative Extension[6] indicates that some heavy weight calves are placed into feedlots directly without grazing as stockers. This is especially true in the Imperial Valley (Imperial County), where calves in or out of the valley are sent to feedlots following weaning and fattened for about seven months. With exclusion of 222,000 head of feeders in Imperial Valley (see section 1.3 for how the feeders population of Imperial county was estimated), the statewide stocker population is estimated as half of the remainder. The calculations, explained in following equations, result in 289,000 head stockers and 511,000 head feeders at statewide.

$$\text{Stockers} = (\text{Other Heifers}_{\text{CDFA}} + \text{Steers}_{\text{CDFA}} - \text{Feeders}_{\text{imperial}}) / 2$$

$$\text{Feeders} = (\text{Other Heifers}_{\text{CDFA}} + \text{Steers}_{\text{CDFA}}) - \text{Stockers}$$

1.3 Apportioning by County

[Needs work to make this more understandable.] In California, while it is common to move cattle between counties or in and out of the states, some cattle's populations remain

proportional to cows population. This allows us to apportion the statewide population to counties based on the county specified cow populations. The challenge of apportioning by county is the cattle are aggregated so that their population is not tied only to counties. Such cattle include young dairy heifer, dairy calves, stockers, and feeder[7], and their populations are estimated in different approaches. The county total of all estimated subcategories is consistent with those published by CDFA.

In general, the populations of dairy bulls and pregnant dairy heifers are proportional to dairy cow population, so are beef bulls, beef heifers, and beef calves associated with beef cows. After distributing those subcategories' statewide data based on the cow population, the remainder of each county is the sum of young dairy heifer, dairy calves, stockers, and feeders. For young dairy heifer and dairy calves, because their county populations cannot be estimated based on cow population, we use the remainders to distribute the statewide populations. This approach implies that more remainders result in more young dairy heifer and dairy calves. After apportioning young dairy heifers and dairy calves to counties, the remainder includes stockers and feeders.

Based on a CCA report, in 1999, feedlots are only operated in seven counties: Colusa, Fresno, Kern, Madera, Stanislaus, Tulare, and Imperial. By assuming that during the years of 1997-2000, those feedlots continued to operate and no new ones were built in other counties, the remainders of all non-feedlot counties are consequently all stockers. In Imperial county, calves are typically moved to feedlot without grazing, so the population of stockers are zero and feeders are all the remainders. For the other six feedlot counties, the undistributed stockers and feeders were apportioned proportional to their remaining cattle population.

1.4 Apportioning by Air Basin

Some counties are split by air basin boundaries, so it is necessary to estimate how many cattle are within the portion of the county within each air basin[4]. The information in the previous ARB report "Estimation of Ammonia Emissions from Beef and Dairy Cattle in California" was used as the basis of apportioning populations by air basin. Air Basin Splits were provided for beef cattle and dairy cattle separately in the report. For beef cattle, the split was based on the square miles of land area, and then adjustments were made in consultation with district staff. Dairy cattle population splits were based on a combination of county acreage and discussion with district staff. The population split for feedlot cattle was classified as the same as range cattle.

Table 4 Cattle Population Splits for Counties in multiple Air Basins

County	Air Basin	% in Air Basin	
		Range Cattle / Feedlot cattle	Dairy Cattle
El Dorado	Lake Tahoe	12	12
	Mountain Counties	88	88

Kern[1]	Mojave Desert San Joaquin Valley	10 90	0 100
Los Angeles[1, 2]	Mojave Desert South Coast	33 67	20 80
Placer[1]	Lake Tahoe Mountain Counties Sacramento Valley	10 61 29	10 61 29
Riverside[1, 2]	Mojave Desert Salton Sea South Coast	43 29 28	1 1 98
San Bernardino[1, 2]	Mojave Desert South Coast	94 6	2 98
Solano[1]	San Francisco Sacramento Valley	48 52	48 52
Sonoma	North Coast San Francisco	61 39	61 39

1. Updated by pasture acreage splits from DWR data

2. Populations for the counties in the south coast AQMD and Mojave Desert AQMD were apportioned based on district population estimates provided by the air districts.

2. Other Livestock (Swine, Poultry, Sheep, Goat, Horse, Other)

Table 5. EICs and Corresponding Census Categories

EIC		CDFA 2000 Statewide Population	1997 Census category
Poultry	Turkey	9,000,000	Turkeys Turkey hens kept for breeding
	Layer	24,056,000	Layers and pullets 13 weeks old and older Pullet chicks and pullets less than 13 weeks old
	Broiler	237,300,000	Broilers and other meat-type chickens
Swine		170,000	Pigs and Hogs
Sheep		820,000	Sheep and Lambs
Goats		15,780	Angora goat Milk goat
Horses		113,110	Horses and ponies

To estimate the county specific population of these livestock, we combined the USDA 1997 Agricultural Census data and the CDFA 2001 Agricultural Resources Directory. The USDA census data, provided by county, are used to distribute the CDFA statewide population data to counties. The supplementary census of 1992 and 1987 from USDA were used for estimating the populations for those counties that data were undisclosed in the 1997 agricultural census. Table 5 summarizes the statewide population of year 2000 and the corresponding census categories used. The estimated populations of swine, poultry, sheep, goats and horses are attached in Appendix B.

Poultry are subdivided into turkeys, layers, and broilers. The CDFA data are the annual productions, and they must be converted to the average population of a year by dividing the number of production cycle. We used US EPA's number of production cycles for each poultry type. The conversion is shown in Table 6. In addition, because the broiler

production was not published for 1998, 1999, and 2000 to avoid disclosure of individual operations, the 1997 data was used.

Table 6. Poultry Statewide Population

	Layer & Pullets	Broiler[1]	Turkeys
CDFA Production	24,056,000	237,300,000	18,000,000
Production Cycle [2]	1	5.5	2
Adjusted Population	24,056,000	43,145,455	9,000,000

1. Data for 1997.
2. U.S. Environmental Protection Agency, Emissions from Animal Feeding Operations (draft), 2001.

The statewide population of swine is the average of CDFA inventory for January 1, 2000 and 2001. The statewide population of sheep is the average of CDFA inventory for December 1, 2000 and 2001.

CDFA didn't publish any population for goats and horses, so we used the 1997 agricultural census data as the population of 2000.

In the 1997 agricultural census, some counties' livestock populations were withheld to avoid the disclosure of individual operations but included in the state total. A common method to fill the missing data is to using the average of total withheld population. While it is a reasonable approach to estimate those small emission categories as swine, sheep, goats, and horses, it is inadequate for poultry.

Poultry are the second largest category other than the cattle in California, and poultry population varies substantially by county. To capture the county variation, it is more sensible to use historical data than withhold the average. Therefore, we combined the 1992 and 1987 agricultural census data to fill the missing data for poultry; the 1987 census were used when 1992 data are unavailable. When populations were concealed in all three years, the average populations were used. Finally, the replacing data were scaled to match the total withhold amount.

The activity of the Other Livestock was temporarily estimated as zero.

Due to the lack of air basin information, the populations of Swine, Poultry, Sheep, Goat, and Horse were apportioned to air basin by using the same splits as were used for cattle. Swine and Poultry were assigned the splits for dairy cattle, and Sheep, Goat, and Horse were assigned the splits for range cattle. Table 6 shows the livestock and the assigned air basin splits.

Table 6. Livestock population splits for counties in multiple air basins

Livestock Class	Assigned Percentage Splits
Swine	Dairy cattle
Poultry	Dairy cattle
Sheep	Range cattle
Goat	Range cattle
Horse	Range cattle

3. Reference:

1. United States Department of Agriculture. 1997 Census of Agriculture, National Agricultural Statistics Service.
2. California Department of food and Agriculture. Agricultural Resource Directory 2001.
3. Katrinia Inchauspe, 2002, Estimates of Ammonia Emissions from Beef and Dairy Cattle in California. (Student intern hired by the California Cattlemen's Association.
4. Air Resources Board, 1999, Estimates of Ammonia Emissions From Beef and Dairy Cattle in California.
5. Beef and Range Workgroup, University of California Cooperative Extension. Beef Care Practices.
6. Dairy workgroup, University of California Cooperative extension. Dairy Care Practices.
7. U.S. Environmental Protection Agency, Emissions from Animal Feeding Operations (draft), 2001.
8. Communication with California Cattlemen's Association, 2002
9. Communication with California Agricultural Statistics Services, 2002

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December 3, 2002

Revisions:
10/01/2003 – Population tables revised by Patrick Gaffney to reflect reallocation of animals within certain counties split by air basin and air district boundaries.
Cattle population split table updated.

Appendix A

Population of Cattle by Subcategory

			Dairy Cattle						Range Cattle							Total All
AB	County	ID #	Cows	Bulls	Pregnant Heifers	Young Heifers	Calves	Total	Beef Cows	Beef Bulls	Beef Heifers	Beef Calves	Stockers	Beef Total	Feedlot	
GBV	Alpine	2	0	0	0	138	274	411	2,000	90	359	837	303	3,589	0	4,000
GBV	Inyo	14	0	0	0	268	533	801	9,500	428	1,705	3,976	590	16,199	0	17,000
GBV	Mono	26	0	0	0	241	479	720	3,500	158	628	1,465	529	6,280	0	7,000
GBV	**Total**		**0**	**0**	**0**	**647**	**1,286**	**1,932**	**15,000**	**676**	**2,692**	**6,277**	**1,422**	**26,068**	**0**	**28,000**
LC	Lake	17	0	0	0	241	479	720	3,500	158	628	1,465	529	6,280	0	7,000
LC	**Total**		**0**	**0**	**0**	**241**	**479**	**720**	**3,500**	**158**	**628**	**1,465**	**529**	**6,280**	**0**	**7,000**
LT	El Dorado	9	0	0	0	38	75	113	549	25	99	230	83	985	0	1,098
LT	Placer	31	0	0	0	184	367	551	1,000	45	179	418	406	2,049	0	2,600
LT	**Total**		**0**	**0**	**0**	**222**	**442**	**664**	**1,549**	**70**	**278**	**648**	**489**	**3,034**	**0**	**3,698**
MC	Amador	3	0	0	0	3,084	6,133	9,217	14,000	631	2,513	5,859	6,780	29,783	0	39,000
MC	Calaveras	5	0	0	0	771	1,532	2,303	14,000	631	2,513	5,859	1,694	24,697	0	27,000
MC	El Dorado	9	0	0	0	272	541	813	3,951	178	709	1,653	598	7,089	0	7,902
MC	Mariposa	22	0	0	0	1,425	2,833	4,258	9,500	428	1,705	3,976	3,133	18,742	0	23,000
MC	Nevada	29	0	0	0	151	301	452	5,000	225	897	2,092	333	8,548	0	9,000
MC	Placer	31	0	0	0	1,127	2,241	3,369	6,110	276	1,097	2,557	2,478	12,517	0	15,886
MC	Plumas	32	0	0	0	674	1,341	2,016	7,000	316	1,256	2,929	1,483	12,984	0	15,000
MC	Sierra	46	0	0	0	206	410	617	3,000	135	538	1,255	454	5,383	0	6,000
MC	Tuolumne	55	0	0	0	922	1,834	2,757	5,000	225	897	2,092	2,028	10,243	0	13,000
MC	**Total**		**0**	**0**	**0**	**8,633**	**17,167**	**25,800**	**67,561**	**3,047**	**12,126**	**28,273**	**18,980**	**129,988**	**0**	**155,788**
MD	Kern	15	0	0	0	0	0	0	4,300	194	772	1,799	16	7,081	3,182	10,263
MD	Los Angeles	19	0	0	0	160	318	477	2,004	90	360	839	586	3,879	0	4,356
MD	Riverside	33	605	14	151	26	52	848	1,174	53	211	491	2,442	4,371	0	5,219
MD	Riverside	33	605	14	151	26	52	848	1,174	53	211	491	2,442	4,371	0	5,219
MD	San Bernardino	36	3,420	77	855	280	557	5,189	3,304	149	593	1,383	29,066	34,495	0	39,684
MD	**Total**		**4,630**	**104**	**1,158**	**492**	**978**	**7,362**	**11,957**	**539**	**2,146**	**5,004**	**34,552**	**54,197**	**3,182**	**64,741**
NC	Del Norte	8	0	0	0	874	1,739	2,613	1,500	68	269	628	1,922	4,387	0	7,000
NC	Humboldt	12	16,500	372	4,125	2,988	5,942	29,926	21,000	947	3,769	8,788	6,569	41,074	0	71,000
NC	Mendocino	23	0	0	0	1,728	3,436	5,163	12,500	564	2,244	5,231	3,798	24,337	0	29,500
NC	Sonoma	49	19,424	438	4,856	2,063	4,103	30,884	9,105	411	1,634	3,810	4,536	19,497	0	50,381
NC	Trinity	53	0	0	0	14	27	41	3,000	135	538	1,255	30	4,959	0	5,000
NC	**Total**		**35,924**	**810**	**8,981**	**7,667**	**15,246**	**68,628**	**47,105**	**2,124**	**8,455**	**19,713**	**16,856**	**94,253**	**0**	**162,881**
NCC	Monterey	27	3,000	68	750	10,789	21,453	36,060	33,000	1,488	5,923	13,810	23,719	77,940	0	114,000
NCC	San Benito	35	0	0	0	2,430	4,832	7,261	18,500	834	3,321	7,742	5,342	35,739	0	43,000
NCC	Santa Cruz	44	0	0	0	321	638	959	2,000	94	373	869	705	4,041	0	5,000
NCC	**Total**		**3,000**	**68**	**750**	**13,539**	**26,923**	**44,280**	**53,500**	**2,416**	**9,616**	**22,421**	**29,766**	**117,720**	**0**	**162,000**
NEP	Lassen	18	0	0	0	1,596	3,174	4,771	26,000	1,172	4,667	10,881	3,510	46,229	0	51,000
NEP	Modoc	25	0	0	0	3,276	6,514	9,789	42,000	1,894	7,538	17,576	7,202	76,211	0	86,000
NEP	Siskiyou	47	0	0	0	2,147	4,269	6,416	34,000	1,533	6,103	14,229	4,720	60,584	0	67,000
NEP	**Total**		**0**	**0**	**0**	**7,019**	**13,957**	**20,976**	**102,000**	**4,600**	**18,308**	**42,686**	**15,431**	**183,024**	**0**	**204,000**
SC	Los Angeles	19	0	0	0	639	1,270	1,909	3,996	180	717	1,672	1,169	7,735	0	9,644
SC	Orange	30	0	0	0	682	1,355	2,037	1,500	68	269	628	1,498	3,963	0	6,000
SC	Riverside	33	118,580	2,674	29,645	5,098	10,138	166,135	1,546	70	277	647	3,214	5,753	0	171,888
SC	San Bernardino	36	167,580	3,779	41,895	13,725	27,292	254,270	196	9	35	82	1,724	2,046	0	256,316
SC	**Total**		**286,160**	**6,452**	**71,540**	**20,143**	**40,055**	**424,351**	**7,238**	**326**	**1,299**	**3,029**	**7,606**	**19,498**	**0**	**443,848**
SCC	San Luis Obispo	40	0	0	0	4,942	9,827	14,769	41,000	1,849	7,359	17,158	10,865	78,231	0	93,000
SCC	Santa Barbara	42	3,000	68	750	3,559	7,078	14,455	26,000	1,172	4,667	10,881	7,825	50,545	0	65,000
SCC	Ventura	56	0	0	0	1,081	2,149	3,230	4,500	203	808	1,883	2,376	9,770	0	13,000
SCC	**Total**		**3,000**	**68**	**750**	**9,582**	**19,054**	**32,454**	**71,500**	**3,224**	**12,833**	**29,922**	**21,067**	**138,546**	**0**	**171,000**

			Dairy Cattle						Range Cattle							Total All
AB	County	ID #	Cows	Bulls	Pregnant Heifers	Young Heifers	Calves	Total	Beef Cows	Beef Bulls	Beef Heifers	Beef Calves	Stockers	Beef Total	Feedlot	
SD	San Diego	37	8,000	180	2,000	1,569	3,120	14,870	6,500	293	1,167	2,720	3,450	14,130	0	29,000
SD	**Total**		**8,000**	**180**	**2,000**	**1,569**	**3,120**	**14,870**	**6,500**	**293**	**1,167**	**2,720**	**3,450**	**14,130**	**0**	**29,000**
SF	Alameda	1	0	0	0	1,211	2,409	3,620	12,000	541	2,154	5,022	2,663	22,380	0	26,000
SF	Contra Costa	7	3,000	68	750	2,445	4,861	11,124	7,000	316	1,256	2,929	5,375	16,876	0	28,000
SF	Marin	21	12,000	271	3,000	1,882	3,743	20,896	8,500	383	1,526	3,557	4,138	18,104	0	39,000
SF	Napa	28	0	0	0	468	931	1,399	4,000	180	718	1,674	1,029	7,601	0	9,000
SF	San Francisco	38	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SF	San Mateo	41	0	0	0	0	0	0	2,000	70	279	651	0	3,000	0	3,000
SF	Santa Clara	43	0	0	0	801	1,593	2,394	9,500	445	1,771	4,129	1,761	17,606	0	20,000
SF	Solano	48	723	16	181	815	1,620	3,355	3,615	163	649	1,513	1,791	7,731	0	11,086
SF	Sonoma	49	12,576	284	3,144	1,336	2,657	19,996	5,895	266	1,058	2,467	2,937	12,623	0	32,619
SF	**Total**		**28,299**	**638**	**7,075**	**8,958**	**17,813**	**62,783**	**52,510**	**2,364**	**9,411**	**21,942**	**19,694**	**105,922**	**0**	**168,705**
SJV	Fresno	10	89,000	2,007	22,250	48,945	97,329	259,530	20,000	902	3,590	8,370	531	33,393	107,077	400,000
SJV	Kern	15	62,000	1,398	15,500	14,546	28,925	122,368	38,700	1,745	6,946	16,195	142	63,729	28,639	214,737
SJV	Kings	16	130,000	2,931	32,500	894	1,779	168,104	3,000	135	538	1,255	1,966	6,896	0	175,000
SJV	Madera	20	38,000	857	9,500	8,358	16,620	73,335	16,000	722	2,872	6,696	91	26,380	18,285	118,000
SJV	Merced	24	200,000	4,510	50,000	19,964	39,699	314,173	31,000	1,398	5,564	12,973	43,892	94,827	0	409,000
SJV	San Joaquin	39	96,000	2,165	24,000	11,562	22,992	156,719	20,000	902	3,590	8,370	25,420	58,281	0	215,000
SJV	Stanislaus	50	157,000	3,540	39,250	30,389	60,429	290,608	46,000	2,074	8,256	19,250	330	75,911	66,481	433,000
SJV	Tulare	54	358,000	8,072	89,500	28,958	57,584	542,113	33,000	1,488	5,923	13,810	314	54,536	63,351	660,000
SJV	**Total**		**1,130,000**	**25,479**	**282,500**	**163,616**	**325,356**	**1,926,951**	**207,700**	**9,366**	**37,279**	**86,920**	**72,687**	**413,953**	**283,833**	**2,624,737**
SS	Imperial	13	0	0	0	101,123	201,087	302,210	1,500	68	269	628	0	2,465	222,325	527,000
SS	Riverside	33	1,210	27	303	52	103	1,695	1,606	72	288	672	3,340	5,979	0	7,674
SS	**Total**		**1,210**	**27**	**303**	**101,175**	**201,191**	**303,906**	**3,106**	**140**	**557**	**1,300**	**3,340**	**8,443**	**222,325**	**534,674**
SV	Butte	4	1,000	23	250	725	1,442	3,440	8,500	383	1,526	3,557	1,594	15,560	0	19,000
SV	Colusa	6	0	0	0	833	1,656	2,489	6,500	293	1,167	2,720	9	10,689	1,822	15,000
SV	Glenn	11	16,500	372	4,125	3,043	6,051	30,091	19,000	857	3,410	7,951	6,690	37,909	0	68,000
SV	Placer	31	0	0	0	533	1,060	1,593	2,890	130	519	1,209	1,172	5,921	0	7,514
SV	Sacramento	34	18,000	406	4,500	3,749	7,456	34,111	15,000	676	2,692	6,277	8,243	32,889	0	67,000
SV	Shasta	45	0	0	0	1,266	2,517	3,783	24,000	1,082	4,308	10,044	2,783	42,217	0	46,000
SV	Solano	48	777	18	194	876	1,741	3,606	3,885	175	697	1,626	1,925	8,308	0	11,914
SV	Sutter	51	0	0	0	785	1,561	2,345	3,000	135	538	1,255	1,725	6,655	0	9,000
SV	Tehama	52	5,000	113	1,250	3,550	7,060	16,973	33,000	1,488	5,923	13,810	7,806	62,027	0	79,000
SV	Yolo	57	0	0	0	1,026	2,040	3,065	6,500	293	1,167	2,720	2,255	12,935	0	16,000
SV	Yuba	58	3,000	68	750	3,987	7,928	15,733	7,000	316	1,256	2,929	8,766	20,267	0	36,000
SV	**Total**		**44,277**	**998**	**11,069**	**20,373**	**40,512**	**117,229**	**129,275**	**5,830**	**23,203**	**54,100**	**42,969**	**255,377**	**1,822**	**374,428**

	Dairy Cattle						Range Cattle							Total All
Grand Total	Cows	Bulls	Pregnant Heifers	Young Heifers	Calves	Total	Beef Cows	Beef Bulls	Beef Heifers	Beef Calves	Stockers	Beef Total	Feedlot	
	1,544,500	**34,825**	**386,125**	**363,875**	**723,579**	**3,052,905**	**780,000**	**35,175**	**140,000**	**326,421**	**288,838**	**1,570,433**	**511,163**	**5,134,500**

Appendix B

Population of Swine, Poultry, Sheep, Goats, and Horses

			Poultry							
AB	County	ID #	Broiler	Layer & Pullets	Turkey	Total Poultry	Swine	Sheep	Horse	Goat
GBV	Alpine	2	0	0	0	0	0	0	89	0
GBV	Inyo	14	0	287	0	287	10	154	562	0
GBV	Mono	26	0	28	0	28	987	7,824	352	0
GBV Total			**0**	**315**	**0**	**315**	**997**	**7,978**	**1,003**	**0**
LC	Lake	17	89	6,243	35	6,367	113	1,123	554	184
LC Total		**0**	**89**	**6,243**	**35**	**6,367**	**113**	**1,123**	**554**	**184**
LT	El Dorado	9	55	150	5	210	23	261	194	46
LT	Placer	31	91	289	11,190	11,570	26	329	237	53
LT Total			**147**	**439**	**11,195**	**11,780**	**49**	**590**	**431**	**99**
MC	Amador	3	98	14,417	0	14,516	42	1,162	841	677
MC	Calaveras	5	407	14,686	2,204	17,297	83	1,521	920	243
MC	El Dorado	9	398	1,076	35	1,510	165	1,879	1,396	328
MC	Mariposa	22	1,653,743	14,602	52,336	1,720,681	987	380	756	146
MC	Nevada	29	69	691	28	789	81	1,268	880	146
MC	Placer	31	557	1,766	68,373	70,695	159	2,012	1,451	324
MC	Plumas	32	66	341	11	418	107	593	427	9
MC	Sierra	46	0	23	0	23	987	5,197	110	0
MC	Tuolumne	55	19	168	518,717	518,903	26	558	696	374
MC Total			**1,655,358**	**47,770**	**641,704**	**2,344,832**	**2,639**	**14,569**	**7,477**	**2,247**
MD	Kern	15	0	0	0	0	0	15,597	342	15
MD	Los Angeles	19	100,065	1,193	99	101,357	270	2,869	1,909	140
MD	Riverside	33	5	74,486	1	74,492	17	14,806	4,175	317
MD	San Bernardino	36	14,045	57,405	480	71,929	229	16,647	3,505	1,065
MD Total			**114,115**	**133,084**	**580**	**247,779**	**516**	**49,919**	**9,931**	**1,536**
NC	Del Norte	8	0	152	0	152	987	100	33	0
NC	Humboldt	12	165	681	21	866	641	4,714	1,408	374
NC	Mendocino	23	272	2,304	27,429	30,005	1,446	12,042	1,494	253
NC	Sonoma	49	1,512,250	459,300	96,242	2,067,792	506	13,531	2,521	846
NC	Trinity	53	0	477	23	500	47	164	276	146
NC Total			**1,512,687**	**462,913**	**123,716**	**2,099,316**	**3,627**	**30,551**	**5,732**	**1,618**
NCC	Monterey	27	92	2,637	34	2,763	384	1,796	1,576	818
NCC	San Benito	35	1,653,743	141,856	106,568	1,902,167	434	3,537	1,247	94
NCC	Santa Cruz	44	83	141,856	8	141,947	85	5,197	760	121
NCC Total		**0**	**1,653,918**	**286,349**	**106,610**	**2,046,877**	**903**	**10,529**	**3,583**	**1,033**
NEP	Lassen	18	313	612	23,988	24,912	281	2,204	1,403	146
NEP	Modoc	25	34	319	26,162	26,515	85	10,961	1,340	228
NEP	Siskiyou	47	198	910	7	1,115	1,645	3,925	1,714	21
NEP Total			**545**	**1,840**	**50,156**	**52,542**	**2,011**	**17,089**	**4,457**	**395**
SC	Los Angeles	19	400,259	4,772	398	405,429	1,079	5,721	3,807	279
SC	Orange	30	0	14,388	0	14,388	987	86	1,429	0
SC	Riverside	33	491	7,299,653	109	7,300,253	1,634	9,744	2,748	209
SC	San Bernardino	36	688,208	2,812,826	23,500	3,524,534	11,230	988	208	63
SC Total			**1,088,957**	**10,131,639**	**24,007**	**11,244,604**	**14,930**	**16,538**	**8,191**	**551**

			Poultry							
AB	County	ID #	Broiler	Layer & Pullets	Turkey	Total Poultry	Swine	Sheep	Horse	Goat
SCC	San Luis Obispo	40	1,134	8,298	29	9,462	808	22,101	4,710	312
SCC	Santa Barbara	42	107	156,131	34	156,271	161	10,720	5,266	97
SCC	Ventura	56	313	1,182,263	115	1,182,691	987	303	3,008	146
SCC Total		**0**	**1,554**	**1,346,692**	**178**	**1,348,424**	**1,956**	**33,125**	**12,984**	**555**
SD	San Diego	37	207,859	2,741,611	133	2,949,603	1,257	1,035	8,158	509
SD Total			**207,859**	**2,741,611**	**133**	**2,949,603**	**1,257**	**1,035**	**8,158**	**509**
SF	Alameda	1	331,655	318	8	331,981	80	1,268	1,943	228
SF	Contra Costa	7	24	343	0	366	65	299	2,523	374
SF	Marin	21	0	170	55,862	56,032	987	13,435	723	146
SF	Napa	28	1,653,743	920	24,034	1,678,697	184	520	805	782
SF	San Francisco	38	0	0	0	0	0	0	0	0
SF	San Mateo	41	0	353	169	522	38	109	1,129	0
SF	Santa Clara	43	113	141,897	23	142,034	157	742	2,815	136
SF	Solano	48	54	376	40	471	63	28,750	691	70
SF	Sonoma	49	979,101	297,372	62,312	1,338,785	327	8,761	1,633	547
SF Total			**2,964,690**	**441,750**	**142,448**	**3,548,888**	**1,902**	**53,883**	**12,261**	**2,283**
SJV	Fresno	10	12,179,422	466,446	1,879,251	14,525,118	6,055	35,210	3,795	2,290
SJV	Kern	15	93	141,926	120	142,139	1,593	140,370	3,074	131
SJV	Kings	16	1,822,301	50,456	962,397	2,835,154	987	5,197	604	877
SJV	Madera	20	873,471	885	785,475	1,659,831	277	10,302	2,313	82
SJV	Merced	24	1,653,743	1,400,055	1,537,664	4,591,461	6,337	15,201	1,467	654
SJV	San Joaquin	39	404,378	3,058,868	2,216	3,465,462	1,532	22,950	3,530	111
SJV	Stanislaus	50	12,189,388	3,024,069	1,570,665	16,784,122	17,855	2,669	3,464	1,670
SJV	Tulare	54	2,756,185	28,141	355,086	3,139,412	93,293	63,581	2,555	819
SJV Total			**31,878,980**	**8,170,846**	**7,092,873**	**47,142,699**	**127,929**	**295,479**	**20,802**	**6,634**
SS	Imperial	13	0	128	0	128	180	173,377	198	0
SS	Riverside	33	5	74,486	1	74,492	17	10,125	2,855	217
SS Total			**5**	**74,614**	**1**	**74,620**	**196**	**183,502**	**3,053**	**217**
SV	Butte	4	778	1,929	43	2,750	5,487	2,331	1,150	54
SV	Colusa	6	1,653,743	141,856	6	1,795,604	210	7,513	448	228
SV	Glenn	11	55	361	40	455	1,376	8,496	1,039	145
SV	Placer	31	264	835	32,340	33,439	75	952	686	153
SV	Sacramento	34	409,736	61,013	745,367	1,216,115	1,262	4,433	3,913	519
SV	Shasta	45	279	1,189	99	1,568	219	1,482	1,708	146
SV	Solano	48	58	404	43	506	68	30,898	742	76
SV	Sutter	51	26	436	2,204	2,666	216	16,114	503	0
SV	Tehama	52	287	846	26,162	27,295	367	6,821	2,138	146
SV	Yolo	57	210	552	37	798	1,133	23,898	1,392	46
SV	Yuba	58	1,116	475	21	1,613	560	1,150	773	25
SV Total			**2,066,550**	**209,895**	**806,363**	**3,082,809**	**10,973**	**104,088**	**14,492**	**1,537**

	Poultry							
Grand Totals	Broiler	Layer & Pullets	Turkey	Total Poultry	Swine	Sheep	Horse	Goat
	43,145,455	**24,056,000**	**9,000,000**	**76,201,455**	**170,000**	**820,000**	**113,110**	**19,397**